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EXAMINER

AKRAM, IMRAN

ART UNIT

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1723

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/589,158	Applicant(s) SEEMANN ET AL.	
	Examiner IMRAN AKRAM	Art Unit 1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-22 is/are rejected.
- 7) ☒ Claim(s) 9-22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 8/16/10 have been fully considered but they are not persuasive. The reference rejections still apply, albeit in different form as necessitated by amendment.
2. Applicant has filed a 132 Affidavit in addition to arguments filed, but the arguments filed contain all the arguments found in the 132 Affidavit so they will be addressed simultaneously.
3. Applicant asserts on page 7 of the Arguments that claim 9 should not be rejected under USC 112 since ratio values do not need units. While this may be true, what is unclear, as written in the rejection below, is whether these values are ratios or not. The relevant portion of claim 9 currently reads "a concentration of H₂/CO in the initial gas mixture in the range of 0.25 to 5 when the feed gas is brought into contact with the fluidized bed catalyst." This should be written more clearly to claim what the Applicant asserts is meant: that the concentration or ratio between H₂/CO in the initial gas mixture is in the range of 0.25 to 5. As written, the claim is indefinite.
4. Applicant asserts on paragraph 2 of page 10 of the Arguments that Child does not contain higher hydrocarbons or aromatic hydrocarbons. This is true, but the Broecker reference is relied upon for this deficiency. Applicant also asserts that the Child reference "does not comprise the use of a fluidized bed catalyst." Examiner respectfully disagrees. Child does indeed disclose a fluidized bed catalyst (see claim 13 of Child).

5. Applicant asserts on pages 10-11 of the Arguments that the Broecker reference cracks the C₂ hydrocarbons and aromatics before feeding them to the methanation bed so the feed gas is completely free of either and consequently not reading on the claim. Examiner respectfully disagrees. As is true of *all* reactions, efficiency is never 100%. Broecker discloses a method of methanating syngas by cracking C₂ and aromatics prior to feeding the reactants to the methanation catalyst (in the case of the rejection, the methanation catalyst of Child is used). But since an amount of C₂ is not claimed, and the claimed amount of aromatics is *less* than 10%, any minor amount of C₂ and aromatics (including in the ppb range) reads on the claims. It is the Examiner's position that in the combination of Child and Broecker, a minor amount of aromatic and C₂ hydrocarbon would be feed from the cracking process of Broecker to the methanation process of Child and consequently read on the claims as filed.
6. Applicant's arguments with respect to claim 21 have been considered but are moot in view of the new ground(s) of rejection necessitated by amendment.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:
- The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
8. Claims 9-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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9. Independent claim 9 recites the limitation "a concentration of H₂/CO in the initial gas mixture in the range of 0.25 to 5." These values are arbitrary without units, however, and the specification uses the same language. It is impossible to ascertain whether the values of 0.25 and 5 are ratios between hydrogen to carbon monoxide or a percentage of hydrogen and carbon monoxide in the initial gas mixture. If the latter, then it is unclear whether the entire concentration of hydrogen and carbon monoxide is 0.25% (or 5%) or each the hydrogen and carbon monoxide concentration is 0.25% (or 5%). Again, the specification does not provide any further details. Claims 10-22 depend on claim 9.

Claim Objections

10. Claims 9-22 are objected to because of the following informalities: line 4 of claim 9 misspells gasification as "gassification." Appropriate correction is required.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 9-20 and 22-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Child (US 3,928,000) in view of Broecker (3,912,775) and Applicant's admitted prior art.

15. Regarding claims 9-20 and 22, Child discloses providing a syngas comprising CH₄, H₂, CO₂, CO, and steam with an H₂/CO of 1.0-2.5 (column 3, lines 57-63), contacting the syngas with fluidized bed comprising catalyst particles at 20 to 1000 microns at 315 to 815°C, 1 atm (~1 bar), a space velocity of 80 to 10,000 per hour, and a residence time of 0.5 to 10 seconds (column 6, lines 1-24). The catalyst bed comprises 33 to 78 weight percent nickel oxide on an alumina base (column 7, lines 41-47). Filtering the feedstock with activated carbon is not a necessary step in Child (column 6, lines 51-54). Child does not disclose the use of C₂ or aromatic hydrocarbons

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in the feed gas mixture (syngas), however. Broecker—in an invention for the production of methane from syngas—discloses that the feed gas mixture can contain aromatic hydrocarbons of up to 20% depending on the feedstock desired (column 3, line 57 to column 4, line 2) and unsaturated and aromatic compounds in the range of 1 to 10% by volume (column 11, lines 60-66). Broecker discloses cracking the feedstock before sending it a methanation reactor, eliminating most of the C_2 and aromatics, but discloses the deleterious effects of nitrogen, something the invention of Child does not possess. It would have been obvious to one having ordinary skill in the art at the time of invention to use the methanation reaction of Child with the feedstock of Broecker to methanate the feedstock of Broecker without having to remove the nitrogen components.

16. Neither Child nor Broecker discloses that the feedstock source is biomass gasification. Applicant, on lines 21-37 of page 2 of the instant specification, discloses the prevalence of aromatics and C_2 components in the effluent of biomass gasification and their deleterious effect on methanation. It would have been obvious to one having ordinary skill in the art at the time of invention use the processes of Child and Broecker on the output of biomass gasification as it would mostly eliminate the deleterious aromatics and C_2 components without having to remove sulfur to achieve maximum methane production.

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17. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Child '000 and Broecker as applied to claim 9 above, and further in view of Child '113 (US 3,890,113)

18. Neither Child '000 nor Broecker discloses the use of benzene or toluene. Child '113—in an invention for the production of methane from produced syngas—discloses that benzene and toluene are common feedstock starting materials (column 2, line 66-68). It would have been obvious to one having ordinary skill in the art at the time of invention for the aromatics of Child '000 and Broecker to be toluene and benzene as these are common feedstocks for methanation as shown in Child '113.

Conclusion

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IMRAN AKRAM whose telephone number is (571)270-3241. The examiner can normally be reached on 10-7 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/I. A./
Examiner, Art Unit 1723

/Alexa D. Neckel/
Supervisory Patent Examiner, Art Unit 1723